FINAL REPORT

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Using the NED decision support system to improve fuels management decision processes

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Description of Project:

The purpose of this study is to assist fire resource managers to characterize and reduce uncertainty, identify fire risk, and improve decision-making processes in the wildland/urban interface as well as the broader forested wildlands. We propose expanding the existing NED decision support system so that it can be used by fire resource managers to assess and reduce the risk of fire hazard to human life; financial loss of property from a fire incident; and provide an evaluation of the impact of various fuels manipulation/reduction methods on future fire behavior and severity as well as ecosystem function, health, and productivity. This study is composed of 4 major tasks: (1) produce risk assessment guidelines for fuels management in wildland/urban interfaces;(2) provide guidelines for evaluating the impact of fuels management strategies on wildland ecosystems; (3) expand the NED DSS to incorporate new fire risk reduction and fuels management goals; and (4) test the new system for internal accuracy and user utility.

Status Report:

This report is our final one. Accomplishments for each of the 4 task areas are:

1. Fuels management in wildland/urban interface: risk ratings have been prepared for different landscapes, ecosysystems, and fuel mixes. Risk assessment procedures have been developed. A scientific paper has been presented and published.
2. Fuels management in wildland ecosystems: guidelines have been developed for impact of fuels manipulation/reduction methods on fire behavior and severity. Risk assessment procedures have been developed. A scientific paper has been presented and published.
3. The NED-2 decision support system has been changed to implement 1 and 2 above into a hazard rating system. New goals have been defined for the decision process. NED-2 is publicly available for downloading from the Internet site at: http://www.fs.fed.us/ne/burlington/ned/ned2home.htm .
4. The new version of NE-2 was tested both internally and externally. An external evaluation was carried out by Ludie Ehlers, a graduate student working under the direction of Dr. Alan Long. This evaluation focused on whether the Fire Risk Assessment Guides developed by this project were useful (Ehlers 2004). We sent a questionnaire to 174 fire experts in the southern United States. We received 41 useable responses from experts in nine states. 86% of respondents indicated that our guide was useful and that they would promote its use by homeowners in their area. Following the successful completion of this external evaluation, we conducted an evaluation to the NED-2 software to make sure it accurately followed the guide. The internal evaluation consisted of developing fire scenarios commonly found in the southern United States. Brian Hinton, a graduate student working under the direction of Dr. Alan Long at the University of Florida, exercised the model over a two month period of time in the summer of 2006 and compared the NED-2 software answers to those from expert opinion as formulated and described in Hemel et al. 2005 and Long et al. 2005 (below). After identifying and fixing a few errors, the test found complete agreement between the NED-2 model and the previously

evaluated fire risk guides.

We have created a comprehensive, stand-based and small ownership based, fire risk assessment process for the southern United States. We have produced a description of this process in the form of printed guides, implemented this logic into the NED-2 Decision Support Systems, made this material easily accessible from the NED-2 homepage on the Internet. We have also evaluated the basic logic of the system using a survey to fire experts south-wide and gotten the feedback that 86% of respondents think the system is useful. Finally, we presented the results in May 2005 at a major National Conference on Fire.

Publications:

Ehlers, Ludie A. 2004. Creating a wildfire risk assessment guide for homeowners in the southern United States. Technical Paper presented to the School of Forest Resources and Conservation at the University of Florida as a partial requirement for the Master of Forest Resources and Conservation Degree, 28 pp.

Hemel, Brian. 2004. Prescribed burning in Tennessee: barriers, goals, and information needs for private, state, and federal managers. Masters Thesis, University of Tennessee, Knoxville, TN, 31 pp.

Hemel, B. T. 2005. Wildland Fire Risk Assessment Guide for the Southern United States. Available for download from the NED Internet Site at www.fs.fed.us/ne/burlington/ned/ned2home.htm. 12 pp.

Hemel, B.T.,C.K. Routh, D.S. Buckley, A.J. Long, H.M. Rauscher, W.G. Hubbard, and D.E.Nute. 2005. Development of a wildland fire component for the NED decision support system. In: EastFIRE Conference Proceedings; EastFIRE Conference; George Mason University; May 11-13, 2005; Fairfax, VA. 4 P. (CD).

Long, Alan J. 2005. Wildfire Risk Assessment Guide for Homeowners in the Southern United States. Available for download from the NED Internet Site at www.fs.fed.us/ne/burlington/ned/ned2home.htm. 13 pp.

Long, Alan J., Michael Rauscher, and Wayne Zipperer. 2005. Enhancing the NED Decision Support System with wildfire risk assessments. In: EastFIRE Conference Proceedings; EastFIRE Conference; George Mason University; May 11-13, 2005; Fairfax, VA. 4 P. (CD).

NED-2 Decision Support System. 2005. NED-2 Software Administrative and Downloading Site. www.fs.fed.us/ne/burlington/ned/ned2home.htm.

Rauscher, H. Michael, Cy Routh, Brian Hemel, and Alan Long. 2005. User's Guide for the Fire Risk Management Goal in NED-2. Available for download from the NED Internet Site at www.fs.fed.us/ne/burlington/ned/ned2home.htm. 15 pp.

Routh, Cy. 2004. The NED-2 forest ecosystem management DSS: the integration of wildfire risk and GIS agents. Masters Thesis, University of Georgia, Athens, 108 pp.

Appendix 1. Crosswalk between proposed and delivered activities.

Proposed	**Delivered**	**Status**
Risk Assessment Procedure: wildland-urban interface	Long, Alan J. 2005. Wildfire Risk Assessment Guide for Homeowners in the Southern United States. Available for download from the NED Internet Site at www.fs.fed.us/ne/burlington/ned/ned2home.htm. 13 pp.	Done
Risk Assessment Procedure: wildland ecosystems	Hemel, B. T. 2005. Wildland Fire Risk Assessment Guide for the Southern United States. Available for download from the NED Internet Site at www.fs.fed.us/ne/burlington/ned/ned2home.htm. 12 pp.	Done
NED-2 DSS Fire Goal Extension	Routh, Cy. 2004. The NED-2 forest ecosystem management DSS: the integration of wildfire risk and GIS agents. Masters Thesis, University of Georgia, Athens, 108 pp.	Done
Evaluation and Testing	Ehlers, Ludie A. 2004. Creating a wildfire risk assessment guide for homeowners in the southern United States. Technical Paper presented to the School of Forest Resources and Conservation at the University of Florida as a partial requirement for the Master of Forest Resources and Conservation Degree, 28 pp. Unpublished internal testing of NED-2 for accuracy.	Done
NED-2 Software Download Website	www.fs.fed.us/ne/burlington/ned/ned2home.htm.	Done
Publications	See enclosed CD and hard copies of all publications	Done
Presentations	Hemel, B.T.,C.K. Routh, D.S. Buckley, A.J. Long, H.M. Rauscher, W.G. Hubbard, and D.E.Nute. 2005. Development of a wildland fire component for the NED decision support system. In: EastFIRE Conference Proceedings; EastFIRE Conference; George Mason University; May 11-13, 2005; Fairfax, VA. 4 P. (CD). Long, Alan J., Michael Rauscher, and Wayne Zipperer. 2005. Enhancing the NED Decision Support System with wildfire risk assessments. In: EastFIRE Conference Proceedings; EastFIRE Conference; George Mason University; May 11-13, 2005; Fairfax, VA. 4 P. (CD).	Done